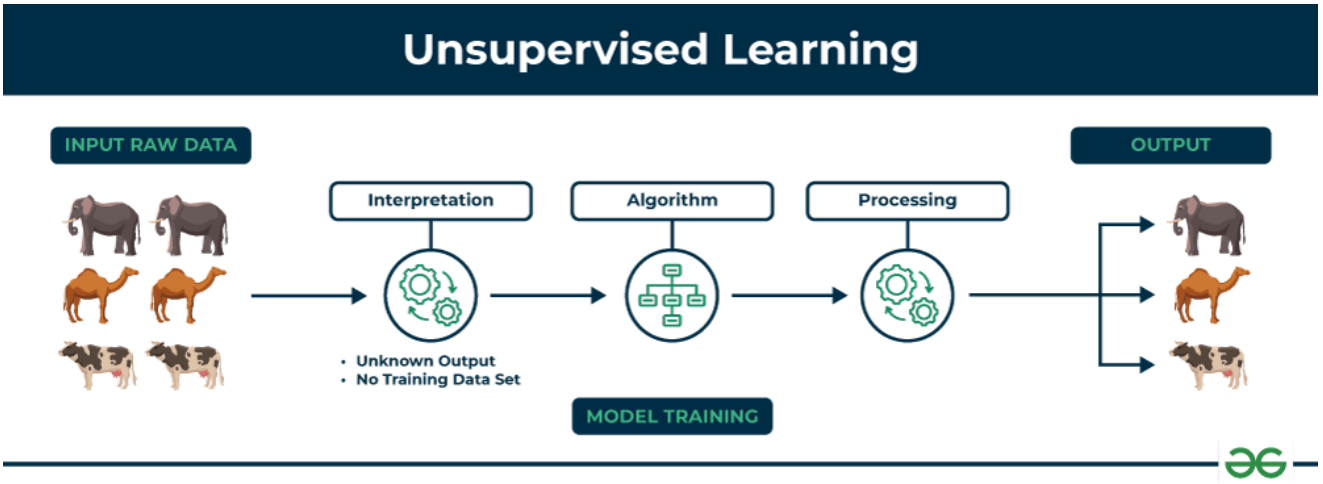
2. Unsupervised Learning

Understand clustering and dimensionality reduction.



Another type of a machine learning technique where the model is on data without labeled responses.
Goal: Infer the natural structure present within a set of data points.

Unlike supervised learning, there are no explicit target outputs, and the algorithm tries to learn the patterns and the structure from the data itself.

Two common tasks in this technique,

1. Clustering
2. Dimensionality reduction

Clustering

Task of grouping a set of objects in such a way that objects in the same group (called a cluster) are more similar to each other than to those in other groups.

Key Clustering Algorithms,

1. K-Means Clustering
2. Hierarchical Clustering
3. DBSCAN(Density-Based Spatial Clustering of Applications with Noise)

Dimensionality Reduction

Dimensionality reduction involves reducing the number of random variables under consideration by obtaining a set of principal variables.
Useful for compressing data, reducing computational costs, and mitigating the curse of dimensionality.

Key dimensionality reduction techniques,

1. Principal component Analysis(PCA)
2. t-Distributed Stochastic Neighbour Embedding (t-SNE)
3. Linear Discriminant Analysis (LDA)